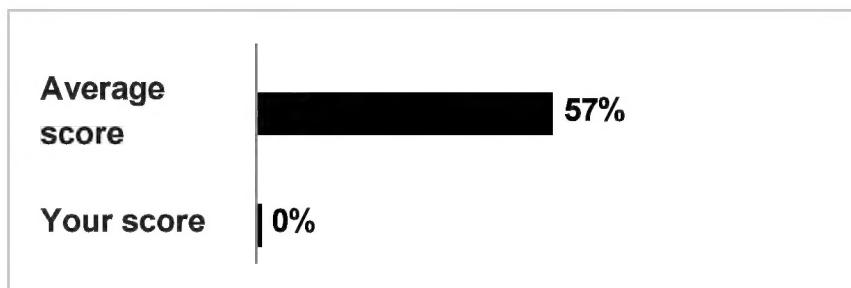


Medicine Quiz 5

Medicine Quiz 5

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Answered Review

1. Question

1 points

A 1-year-old boy is brought to the clinic by his 28-year-old Australian mother for the evaluation of his eyes. For the past several months, he has been bumping into objects. His perinatal history is unremarkable. Physical examination of the eyes reveals a bilateral white reflex. The retina cannot be visualized properly. Fundal reflection is absent, and the pupil is white. What is the most likely diagnosis?

1. Congenital glaucoma
2. Congenital cataract ✓
3. Retinoblastoma
4. Pterygium

INCORRECT ✗

The correct answer is 2.

The most common cause of white reflex in the pediatric population is congenital cataract.

(Choice 3) Even if congenital cataracts are more common, all children with white reflex should be referred to an ophthalmologist immediately to rule out a retinoblastoma.

(Choice 4) Pterygium is a triangular encroachment of the conjunctiva onto the nasal side of the cornea. It is usually seen in patients over the age of 35, and is usually associated with constant exposure to wind, sand, sun and dust.

2. Question

1 points

A 35 year old man with a history of chronic heroin abuse comes to the physician because of progressive swelling of his feet and hands. His blood pressure is 155/90mm Hg. Laboratory studies show:

Blood, serum

Creatinine: 1.6 mg/dL

BUN: 20 mg/dL

Urinalysis

Protein: 4⁺

Erythrocytes: 10/hpf

The amount of protein measured in a 24-hour urine collection is 4.5 g. Which of the following is the most likely diagnosis?

1. Acute proliferative glomerulonephritis
2. Crescentic glomerulonephritis

- Focal segmental glomerulosclerosis ✓
- Minimal change disease
- Nodular glomerulosclerosis (Kimmelstiel-Wilson disease)

INCORRECT ✗

The correct answer is 3.

The clinical presentation is consistent with nephrotic syndrome, since proteinuria is within the nephrotic range, i.e., >3 g/day. The history of heroin abuse makes focal segmental glomerulosclerosis (FSG) the most likely diagnosis. FSG may occur in an idiopathic form or in association with three conditions: morbid obesity, HIV infection, and heroin abuse. A renal biopsy will reveal sclerosis occurring in some, but not all, glomeruli (focal), with each glomerulus showing partial involvement (segmental). Electron microscopy shows detachment of epithelial podocytes from the glomerular basement membrane, an alteration also seen in minimal change disease. Note in this clinical case, the coexistence of nephrotic features (marked proteinuria and edema) with nephritic signs (hypertension and microhematuria), which is often present in FSG.

(Choice 1) is characterized by proliferation of endothelial and mesangial cells with influx of leukocytes. The glomeruli are hypercellular, and immune deposits are semimembranous in location. This pattern is associated with nephritic syndrome, i.e., proteinuria <3 g/day, hematuria, hypertension, and pedal and periorbital edema. The prototype of this glomerular disease is postinfectious glomerulonephritis.

(Choice 2) owes its designation to the crescent-shaped masses of cells (epithelial and inflammatory) that accumulate within the urinary space of Bowman capsule, obliterating the glomerular tuft. This results in a rapidly progressive renal failure, requiring aggressive immuno suppressive therapy.

(Choice 4) is mostly a disease of childhood. It manifests with full-blown nephrotic syndrome. On light microscopy, the glomeruli appear normal, only to reveal alterations in epithelial podocytes on electron microscopy.

(Choice 5) is pathognomonic of diabetic nephropathy. Round PAS-positive (i.e., glycoprotein-rich) globules are seen within the glomeruli. This feature, along with diffuse mesangial sclerosis due to accumulation of altered glycoprotein of plasma origin, constitutes the pathologic substrate of diabetes-related renal dysfunction.

3. Question

1 points

A 61 year old man presents for an elective surgical incision and drainage procedure. The patient has an 8-year history of hepatitis C infection with well-documented cirrhosis and portal hypertension. He has a large hematoma on his thigh that is suspected to have necrotic tissue

underlying it and therefore requires debridement. On pre-operative screening, his prothrombin time is noted to be 17.4 seconds. Transfusion of which of the following is the most appropriate next step in management of this patient prior to his procedure?

1. Cryoprecipitate
2. Fresh frozen plasma ✓
3. Packed red blood cells
4. Platelets
5. Whole blood

INCORRECT ✗

The correct answer is 2.

A basic understanding of blood product and blood component replacement is crucial. The use of such products is extremely common, and there is misuse. Patients with liver disease have a deficiency of one or more clotting factors produced by the liver. A blood product that specifically raises such factors is indicated for treatment. Fresh frozen plasma (FFP) generally increases plasma anticoagulation factors by 30%. Like all blood products, it is type specific. There is a correlation for prothrombin times greater than 15 and the risk of bleeding with invasive procedures such as paracentesis. For this reason, FFP is usually indicated in such patients prior to undergoing their procedure.

(Choice 1) Cryoprecipitate is prepared from FFP and contains concentrated factor VIII, factor XIII, fibrinogen, and von Willebrand's factor. Indications for use are hypofibrinogenemia (DIC), von Willebrand's disease, and hemophilia A.

(Choice 3) Packed red blood cells are prepared from all the red cell mass in a pint of donated blood. It has no plasma oruffy coat and therefore no proteins (coagulation factors) or platelets. It is used to restore red cell mass.

(Choice 4) are a blood component therapy used to restore platelet count. One unit of platelets increases the platelet count by 5000-10,000cells/mm³, assuming no ongoing destruction or sequestration. Platelets are usually transfused as a "six-pack." Each unit is the product of one unit donated whole blood; thus, a "six-pack" represents pooled platelets from multiple donors.

(Choice 5) Transfusion of whole blood is not a current practice. Whole blood is the content of 1 pint of donated blood. It is unfiltered and contains plasma, platelets, white cells, and red cells. This product is usually processed so that each of these components is removed (except white cells) and used for transfusions in specific clinical situations.

A 55 year old woman with long-standing diabetes mellitus and a 2-year history of progressive renal failure comes to medical attention because of chest pain for 12 hours. The pain is substernal and continuous, with radiation to the neck. She is on a strict dietary regimen with protein, fluid, and salt restriction. Her temperature is 37.2 °C (99.0 °F), blood pressure is 150/85mm Hg, pulse is 82/min and regular, and respirations are 16/min. There is no jugular vein distention or pitting edema. Auscultation reveals a rubbing sound in the precordial region and slightly distant but normal heart sounds. Lungs are clear to auscultation. The patient is admitted, and laboratory studies show:

Hematocrit: 33%

Hemoglobin: 11.2 g/dL

Leukocyte count: 12,500/mm³

Serum

Urea nitrogen: 102 mg/dL

Glucose: 128 mg/dL

Na: 142 mEq/L

K: 5.3 mEq/L

Cl: 103 mEq/L

Arterial blood

pH: 7.38

PO₂: 92mmHg

PCO₂: 39mmHg

A chest x-ray film shows a normal cardiac outline, and an ECG shows nonspecific ST changes. Echocardiogram reveals mild fluid collection within the pericardial sac. Which of the following is the most appropriate next step in management?

1. Water and salt intake reduction
2. Antibiotic treatment
3. Antihypertensive treatment
4. Anti-inflammatory treatment
5. Erythropoietin administration
6. Hemodialysis ✓

INCORRECT ✗

The correct answer is 6.

A friction rub on auscultation indicates that the patient's chest pain is due to acute fibrinous pericarditis. ECG changes in this condition are often nonspecific, but echocardiography is a sensitive diagnostic tool. Renal failure is one of the most common causes of acute pericarditis (uremic pericarditis), which usually occurs when BUN exceeds 100 mg/dL (often earlier in diabetic patients). Fever is usually absent in uremic pericarditis. Institution of

hemodialysis (or more aggressive hemodialysis) promptly leads to resolution of pericarditis. Indeed, the onset of acute pericarditis is an absolute indication to start hemodialysis treatment.

(Choice 1) Further reduction of water and salt intake would not be sufficient to treat uremic pericarditis and might be counterproductive in this specific case.

(Choice 2) is useful in cases of infective (purulent) pericarditis, but uremic pericarditis is the result of circulating toxins, not infection.

(Choice 3) is often necessary in renal failure but has no effect on uremic pericarditis. In this case, the blood pressure is within “borderline” values.

(Choice 4) is helpful in reducing symptoms but does not affect the natural course of the process. Indomethacin or corticosteroids maybe used.

(Choice 5) is used to treat anemia of renal failure. It is usually started when hematocrit falls below 30 to 35%.

5. Question

1 points

A 28 year old man comes to the emergency department complaining of abdominal pain. He has no significant past medical history, has had no recent illnesses, and denies any alcohol or drug abuse. He reports that 3 days ago, he developed acute pain in his right upper quadrant. The pain was non-radiating and was associated with nausea and two episodes of non bloody, non bilious emesis. He also reports that 2 days ago, he began to turn “yellow.” On examination, he is afebrile and has scleral icterus with mild jaundice of his skin. His right upper quadrant is tender, with no palpable gallbladder and no Murphy’s sign. Determination of which of the following is the most appropriate next step in diagnosis?

1. Serum hepatitis A IgG titer
2. Serum hepatitis A IgM titer ✓
3. Serum hepatitis B surface antibody titer
4. Serum hepatitis C antibody
5. Serum hepatitis C RNA level

INCORRECT ✗

The correct answer is 2.

This patient likely has acute hepatitis A infection. The prodrome of this infection is verisimilar to this patient’s presentation, and within 10-14 days after infection, many patients will manifest varying degrees of abdominal pain as well as jaundice. The disease is self-limiting,

usually transmitted by contaminated shellfish or oral-anal contact with an infected person or their feces, and does not predispose patients to the same long-term risks as infection with the other hepatitis viruses. In the acute setting, serum IgM antibody may be positive.

(Choice 1) A positive serum hepatitis A IgG titer would be seen months after the acute infection has passed and is a marker for previous infection.

(Choice 3) A positive serum hepatitis B surface antibody titer is a marker for previous hepatitis B exposure.

(Choice 4) A positive serum hepatitis C antibody is a marker for hepatitis C infection.

Although both B and C varieties can cause acute viral illnesses similar to the one in this patient, the epidemiology of their transmission is quite different from this patient's risk factors. Both agents are transmitted via blood-to-blood contact, and current epidemiology indicates this is primarily by IV drug abuse exposure to infected blood (e.g., health care workers and needle sticks). Unlike hepatitis A, which has no long-term sequelae and is self-limited, both hepatitis B and C infections are associated with significant long-term morbidity and mortality. Hepatitis C is the most common cause of nonalcoholic cirrhosis and liver failure.

(Choice 5) A positive serum hepatitis C RNA level is a test ordered after initial exposure to hepatitis C and is used to follow the activity of disease over time. Unless hepatitis C infection was suspected in this patient, this test is not appropriate.

6. Question

1 points

A 40 year old woman comes to the physician because of a 6-month history of increasing respiratory difficulty that occurs during mild exercise, such as walking uphill. She is 165 cm (65 in) tall and weighs 58 kg (129 lb), but says that she has lost 4 kg (9 lb) over the past 3 months. Her blood pressure is 120/75 mm Hg, pulse is 85/min, and respirations are 16/min. Chest examination reveals crackles at both lung bases and a diastolic murmur near the cardiac apex. The characteristics of the murmur change with the patient's position. Echocardiography reveals a solid mass that partially fills the left atrium and results in obstruction of the mitral flow. Which of the following is the most likely diagnosis?

1. Fibroelastoma
2. Metastasis
3. Mural thrombus
4. Myxoma ✓
5. Sarcoma

INCORRECT ✕

The correct answer is 4.

Myxoma is the most common primary cardiac tumor. It affects women more frequently than men and grows in the left atrium in 80% of cases. It may present with a systemic illness mimicking infective endocarditis, give rise to systemic embolism, or present with signs and symptoms of mitral valve obstruction (as in this case). The change in murmur when the patient changes position is suggestive of an atrial myxoma. The tumor sometimes produces a diastolic sound consequent to the tumor motion (tumor plop). Echocardiography is diagnostic.

(Choice 1) results from organization of a mural thrombus and is usually clinically silent. It represents an incidental postmortem finding.

(Choice 2) Metastasis to the heart is a relatively rare event that affects the pericardial sac or ventricular wall. Melanoma is the most common malignancy metastasizing to the heart. In addition, malignant neoplasms from the lungs, breast, pleura, and mediastinal organs may involve the heart.

(Choice 3) is a frequent complication of abnormalities in wall motion resulting, for example, from myocardial infarction or atrial fibrillation. Mural thrombosis, however, does not appear as a mass filling the left atrium and does not produce mitral valve obstruction. Its most significant risk is embolization.

(Choice 5) is an exceptionally rare event that would not manifest with an intra-atrial mass.

7. Question

1 points

A 45 year old woman with rheumatoid arthritis develops pain, erythema, and swelling of the cartilaginous portion of both of her external ears. This is accompanied by pain localized to the costochondral joints. Which of the following is the most likely diagnosis?

1. Ankylosing spondylitis
2. Behcet syndrome
3. Gout
4. Reiter syndrome
5. Relapsing polychondritis ✓

INCORRECT ✗

The correct answer is 5.

The patient has relapsing polychondritis, which is an autoimmune condition that occurs as an isolated process or together with other autoimmune diseases, including rheumatoid arthritis, systemic vasculitis, and systemic lupus erythematosus. Presentations can include bilateral swelling of the external ears, nasal involvement, arthralgias to symmetric arthritis (with a

predilection for the costochondral joints), and involvement of the larynx, trachea, and bronchi. The condition can also involve the cardiovascular system, kidney, and skin. In severe cases, the cartilage destruction may be disfiguring (floppy ears, saddle nose).

(Choice 1) causes arthritis of the lower back.

(Choice 2) is characterized by oral ulcers, genital ulcers, and arthritis.

(Choice 3) can cause both arthritis and ear involvement with tophi, but has no particular predilection for the costochondral joints.

(Choice 4) produces urethritis and arthritis, sometimes related to Chlamydia infection.

8. Question

1 points

An otherwise healthy 40 year old woman comes to the physician because she discovered a painless nodule in her neck. On physical examination, palpation reveals a firm 1-cm nodule in the left cervical region, which moves upward as the patient swallows. Thyroid function tests are normal. Fine needle aspiration is positive for papillary carcinoma. Which of the following is a recognized risk factor for this form of cancer?

1. Amiodarone treatment
2. Dietary iodine supplementation
3. Family history of multiple endocrine neoplasia (MEN)
4. Graves disease
5. Hashimoto thyroiditis
6. Radiation to the neck ✓

INCORRECT ❌

The correct answer is 6.

Papillary carcinoma is the most common variant of thyroid carcinomas, and the one associated with the best prognosis. Previous radiation to the neck, whether iatrogenic (for Hodgkin lymphoma, acne, tonsillitis, etc.) or resulting from accidental exposure, is a risk factor for both papillary carcinoma and follicular carcinoma (the latter being the second most common type). The frequency of thyroid cancer is also increased in areas of high goiter incidence.

(Choice 1) is associated with a 2 to 3% incidence of hyperthyroidism in patients treated with this drug, but not with thyroid cancer.

(Choice 2) in salt and water has become standard practice in areas of low iodine concentration as a public health measure to prevent goiter. This has virtually eliminated goiter due to environmental iodine deficiency.

(Choice 3) A family history of multiple endocrine neoplasia (MEN) is not a risk factor. None of the three types of MEN is associated with papillary or follicular carcinoma of the thyroid. MEN types IIA and IIB predispose to medullary carcinoma of the thyroid, which originates from C cells.

(Choices 4 & 5) Clinical evidence linking either Graves disease or Hashimoto thyroiditis to thyroid cancer is still controversial, but it is safe to assume that if there is any increased risk for patients with either disorder, it is very small.

9. Question

1 points

A 40 year old man is admitted for chemotherapy for treatment of acute myelogenous leukemia. A central line through his subclavian vein is inserted to facilitate infusion of chemotherapeutic agents. Ten days after this procedure, he develops a temperature of 39.4 °C (103.0 °F). Physical examination is remarkable for tachycardia and tenderness around the central line insertion site. Blood cultures and a chest x-ray film are negative. Which of the following is the most appropriate next step in management?

1. Repeat blood cultures and wait for culture results to guide therapy
2. Administer amphotericin
3. Administer vancomycin
4. Remove the central line ✓
5. Remove the central line and insert a new one over a guide wire

INCORRECT ❌

The correct answer is 4.

Unfortunately, nosocomial infections are very common in hospitals. Given this patient's physical examination and history, it is most likely that the central line is the site of the current infection. Anything short of removal of the line will not remove the source of the infection, and it will be almost impossible to treat the infection.

(Choice 1) Waiting until the blood cultures grow the offending organism would be risky since the patient's infection would remain untreated and get out of control. If the infecting pathogen is not known, broad coverage is preferred; therapy can be narrowed once the pathogen, and its sensitivity to antibiotics, is known.

(Choice 2) Administering an antifungal agent, such as amphotericin, would be an option if this patient were septic from an infection such as Candida or Aspergillus. This is likely in this patient with leukemia; his immunity is probably suppressed, and he is prone to fungal infections. However, treatment with amphotericin would not address the underlying problem related to the indwelling central line.

(Choice 3) Administering vancomycin would be helpful if this patient were infected with *Staphylococcus*, which is likely in the setting of a line infection. In fact, vancomycin is preferred in this setting; however, it will not be successful until the contaminated line is removed.

(Choice 5) Replacement over the guide wire will simply re-introduce the line infection.

10. Question

1 points

A recently widowed 35 year old woman who has an anxiety disorder, for which she has been treated with alprazolam and imipramine, is brought to the emergency department for a multiple drug overdose. Her daughter states that she may have taken 30-40 tablets of 50-mg imipramine and 35-40 tablets of 1-mg alprazolam. On route to the hospital, she became apneic and was intubated. Her blood pressure is 130/84 mm Hg, and her pulse is 120/min. The patient is unresponsive to painful stimuli, and her pupils react very sluggishly, but there are no other neurologic findings. The ECG shows a normal sinus rhythm with a widened QRS complex. Which of the following is the most appropriate intervention?

1. DC cardioversion
2. Flumazenil
3. Ipecac
4. Lidocaine bolus
5. Maintenance of serum pH at 7.5 ✓

INCORRECT ✘

The correct answer is 5.

Any unknown overdose with QT prolongation on ECG should raise the suspicion of tricyclic antidepressant (TCA) overdose. We know that the patient ingested both TCAs and benzodiazepines in overdose amounts. The ECG changes (QRS widening) are signs of TCA intoxication. The treatment is to maintain an alkalemic state, by hyperventilation if the patient is intubated or with IV bicarbonate. Gastric aspiration and lavage should be performed to eliminate unabsorbed drug if more than 750 mg of TCA has been taken. Seizures may occur in TCA overdose, but this patient also took an overdose of a benzodiazepine, which is likely suppressing the seizures.

(Choice 1) would not be indicated, since this patient is in sinus rhythm.

(Choice 2) would reverse the effects of the benzodiazepine and might precipitate life-threatening seizures.

(Choice 3) would be contraindicated in a comatose patient. Gastric aspiration and lavage would be more suitable.

(Choice 4) is indicated for ventricular dysrhythmias, but this patient was in sinus rhythm.

11. Question

1 points

A 38 year old woman visits the clinic because of oral tenderness and soreness in her jaw for the past 2 months. She admits that swallowing food has become more painful. She notices that her mouth is chronically dry and that drinking lots of fluids seems to reduce the pain. She has a normal appetite but reports that she has lost 2 kg (5 lb) and is eating less because of the pain upon swallowing most foods. Physical examination reveals parched lips, dry oral mucous membranes, and bilaterally enlarged parotid glands with a firm, smooth texture. Needle biopsy of the salivary gland tissue reveals a dense, lymphocytic infiltrate with loss of many glands. Residual glands have prominent intraductal cellular proliferation. Which of the following is the most likely diagnosis in this patient?

1. Mucoepidermoid carcinoma
2. Pleomorphic adenoma
3. Sarcoidosis
4. Sjogren syndrome ✓
5. Squamous cell carcinoma
6. Warthin tumor

INCORRECT ✗

The correct answer is 4.

This is Sjogren syndrome, which is an autoimmune condition that can damage the salivary glands and/or the tear glands. The presence of dry eyes or dry mouth is common, but be aware that about one third of patients have significant parotid gland enlargement (one or both sides) and may present with parotid masses and dry mouth with pain upon swallowing. In cases where a parotid mass is not present, biopsy of the lip may show characteristic changes in minor salivary glands, without the risk of damage to the facial nerve. Patients with Sjogren syndrome may have other autoimmune diseases as well, notably rheumatoid arthritis, scleroderma, and systemic lupus erythematosus.

(Choice 1) is characterized by nests of tumor cells without a dense lymphocytic infiltration.

(Choice 2) is characterized by a variety of histologic patterns with nests, cords, or sheets of benign tumor cells.

(Choice 3) can destroy salivary glands but is characterized by prominent granulomas.

(Choice 5) typically presents as an asymptomatic, white oral patch in a person who smokes, chews tobacco, or drinks alcohol. There is no associated parotid gland enlargement or salivary gland damage.

(Choice 6) is a tumor composed of lymphoid tissue resembling tonsils that is covered by a distinctive, two-cell deep epithelium.

12. Question

1 points

A 52 year old man with a 30-pack-year history of cigarette smoking presents to a physician after moving to a new city. He was told that he had “high cholesterol” about 2 years ago, and he has a history of mild hypertension for which he has never been treated. He had a myocardial infarction (MI) 6 months ago. His post-MI course has been uncomplicated, his exercise stress test was satisfactory, and he has experienced no subsequent chest pain. His medications include one aspirin tablet every other day. Physical examination is normal except for a fourth heart sound. Which of the following is the most appropriate next step in management to prevent significant morbidity and mortality?

1. Add a β -blocker ✓
2. Add enalapril
3. Add nifedipine
4. Increase the aspirin to one tablet three times daily
5. Prescribe nitroglycerin for angina

INCORRECT ✗

The correct answer is 1.

β -blockers have been shown to decrease the incidence of nonfatal reinfarction and recurrent ischemic events. They decrease both infarct size and mortality.

(Choice 2) is recommended for the first 6 weeks in patients with a large anterior wall infarction to decrease mortality by preventing infarct remodeling and expansion, although angiotensin converting enzyme (ACE) inhibitors may be harmful if hypotension is present.

(Choice 3) Calcium-channel blockers, especially diltiazem and verapamil, may be beneficial if the ejection fraction is adequate. Nifedipine has been shown to increase mortality in patients following an MI.

(Choice 4) The patient is already taking one aspirin every other day. Increasing the dose to three tablets daily will not help and, in fact, may hurt him.

(Choice 5) Adding nitroglycerin would be appropriate if the patient developed angina, but at present he has none.

13. Question

1 points

A 17 year old boy of Jewish descent is taken to the emergency department by his mother because of bloody diarrhea. Over the past 2 weeks, the boy has reported frequent urges to defecate that are accompanied by abdominal cramping. Over the past several days, the stools have become looser, and mucus was present around the feces. One hour ago, he saw fresh blood on his stool. On questioning, the boy notes that similar symptoms have occurred over the past 2 years, except for the blood in his stool. His temperature is 37.5 C (99.5 F), blood pressure is 120/70 mm Hg, pulse is 65/min, and respirations are 16/min. His abdomen is soft, without guarding, and there is localized tenderness in the right lower quadrant. Which of the following is the most likely diagnosis?

1. Appendicitis
2. Colon cancer
3. Diverticulitis
4. Mesenteric lymphadenitis
5. Pseudomembranous colitis
6. Ulcerative colitis ✓

INCORRECT ✗

The correct answer is 6.

Ulcerative colitis has a bimodal distribution of age of onset, with a large peak between ages 15 and 30 and a smaller peak between ages 50 and 70. It occurs in both sexes and all races, although there is a somewhat increased rate in the Jewish population. The underlying etiology of the condition is still poorly defined. The presentation illustrated is typical, and many patients have actually had developing disease for several years before the diagnosis is made. The process usually starts in the rectum, and the stool may be hard unless the involved segment of bowel is extensive. Stool mixed with mucus and fresh blood is typical of an exacerbation. With severe disease, accompanying findings can include malaise, fever, anemia, anorexia, weight loss, and leukocytosis. The diagnosis should be confirmed by sigmoidoscopy.

(Choice 1) can occur in teenagers but usually causes left lower quadrant pain and would not produce stool with blood and mucus.

(Choice 2) can produce similar symptoms but is extremely rare among teenagers.

(Choice 3) can produce similar symptoms, but it is a disease of middle-aged to elderly individuals and is not associated with rectal bleeding.

(Choice 4) refers to inflammation of the mesenteric lymph nodes. It often presents acutely in children and is clinically difficult to differentiate from acute appendicitis and enterocolitis. Clinical features of an associated enterocolitis or ileitis in a *Yersinia* infection, such as right lower quadrant pain, fever, diarrhea, nausea, and vomiting, may be present. However, bloody stools are not a feature of mesenteric lymphadenitis.

(Choice 5) is due to a clostridial infection that is usually seen as a complication of broad-spectrum antibiotic use.

14. Question

1 points

A 32 year old man with AIDS has a CD4+ T-cell count of $40/\text{mm}^3$. He complains of a gradual onset of decreased vision in his right eye over the past few days. He is afebrile and has temporal wasting. There is a thick, cheesy, white exudate on his tongue and oropharynx, and there are deficits in the acuity and the visual fields of his right eye. The remainder of the cranial nerve examination is normal. Infection with which of the following pathogens is the most likely cause of his decreased vision?

1. *Candida albicans*
2. *Cytomegalovirus (CMV)* ✓
3. *Herpes simplex virus 1 (HSV-1)*
4. *Mycobacterium avium-intracellulare (MAI)*
5. *Pneumocystis carinii*
6. *Toxoplasmosis*

INCORRECT ✗

The correct answer is 2.

This patient has a very low CD4+ count, predisposing him to a variety of opportunistic infections. This patient's visual symptoms are most likely due to cytomegalovirus (CMV) retinitis, the most common cause of HIV-associated retinitis. Other manifestations of CMV infection include constitutional symptoms, gastrointestinal disturbances, bone marrow suppression, adrenalitis, and lower respiratory tract infections. CMV is treated with ganciclovir or foscarnet.

(Choice 1) Although the thick, cheesy white exudate on the tongue and oropharynx is likely due to *Candida albicans*, which is also common in AIDS patients, this pathogen does not cause visual deficits.

(Choice 3) causes herpes labialis and keratitis. Herpes keratitis occurs initially as conjunctivitis with vesicular blepharitis. Recurrences are termed "dendritic keratitis" and are characterized by branched corneal lesions that look like the veins of a leaf. A foreign body sensation, along with lacrimation, photophobia, and conjunctival hyperemia, may occur at the onset of the condition.

(Choice 4) AIDS patients with CD4+ counts $<100/\text{mm}^3$ are particularly susceptible to infection with *Mycobacterium avium intracellulare (MAI)*. For this reason, such patients are routinely administered MAI prophylaxis with rifabutin. The most common manifestations of

MAI infection are fever of unknown origin, weight loss, and gastrointestinal disease.

(Choice 5) is a common cause of pneumonia in HIV+ patients and is often the first presenting sign of AIDS. Patients with CD4+ counts <200/mm³ should receive prophylaxis against P. carinii pneumonia (PCP) with double-strength trimethoprim sulfamethoxazole (TMP-SMX). In sulfa-allergic patients, dapsone or pentamidine may be used.

(Choice 6) is a rare cause of chorioretinitis in AIDS patients, but the most likely cause of this patient's ocular changes is still CMV. When Toxoplasma does affect the eyes, it causes decreased vision, eye pain, and necrotizing lesions seen on fundoscopy. Most commonly, Toxoplasma affects the brain, with or without focal lesions. Clinical findings in the CNS include an altered mental state, seizures, weakness, cranial nerve disturbances, sensory abnormalities, cerebellar signs, meningismus, movement disorders, and neuropsychiatric manifestations.

15. Question

1 points

A 5 year old boy is brought to the emergency department 4 hours after sudden onset of fever and chills. He was bitten in his right hand by the family's dog 24 hours ago. Examination reveals superficial lacerations of the ulnar aspect of the right hand consistent with a history of dog bite. The wound is surrounded by extensive skin erythema and soft tissue swelling. Palpable lymph nodes are found in the right axilla. His temperature is 38.9 C (102 °F). Which of the following is the most likely pathogen or pathogens?

1. Capnocytophaga canimorsus
2. Eikenella corrodens
3. Mixed aerobic and anaerobic bacteria
4. Pasteurella multocida ✓
5. Staphylococci
6. Streptococci

INCORRECT ✗

The correct answer is 4.

Dog bites are the least likely to become infected compared with cat and human bites. The infection rate for dog bites is only 5%, for cat bites 30 to 50%, and an intermediate figure for human bites. The pathogens accounting for infection are different depending on the biting animal and the time of onset of infection. Early infections (in the first day) due to dog or cat bites are usually secondary to Pasteurella multocida. This agent is sensitive to penicillin or

tetracyclines; however, the response is slow, and treatment should be continued for at least 2 weeks. Early infections following human bites are usually due to mixed aerobic and anaerobic bacteria (**Choice 3**), which are normal components of the oral flora.

(Choices 1,5 & 6) Capnocytophaga canimorsus, Eikenella corrodens, and especially staphylococci and streptococci are responsible for late infections, occurring more than 24 hours after a bite. Capnocytophaga canimorsus is a gram-negative organism of the canine mouth flora, whereas Eikenella corrodens is a saprophyte of the human mouth. The pathogens involved in human bite infections are so variable that therapy should be adjusted once antibiotic sensitivity has been determined on the pathogen(s) isolated from cultured wounds.

16. Question

1 points

A 65 year old woman consults a physician with complaints of severe pain and stiffness of the neck, shoulders, and hips. These symptoms are worst in the morning and after inactivity. The woman has also been experiencing a variety of systemic symptoms, including malaise, low-grade fever, depression, and some weight loss. On physical examination, there is no evidence of erosive or destructive joint disease, no point tenderness when pressure is applied to small joints, no selective muscle weakness or muscle atrophy, and no rheumatoid nodules. Blood studies demonstrate a mild normochromic normocytic anemia, dramatically elevated erythrocyte sedimentation rate, and elevated c-reactive protein. Thyroid-stimulating hormone (TSH) is 0.75mIU/mL. Rheumatoid factor is negative. Electromyography and muscle biopsy fail to demonstrate conclusive evidence of muscle disease. This patient's most likely condition has the strongest association with which of the following?

1. Crohn disease
2. Dermatomyositis
3. Discoid lupus erythematosus
4. Sjogren syndrome
5. Temporal arteritis

INCORRECT

The correct answer is 5.

This patient has polymyalgia rheumatica, which affects older individuals with a 2 to 1 female to male predominance. The disease is characterized by both severe muscle pain with stiffness and usually prominent systemic symptoms, such as malaise, fever, and weight loss. The muscle pain and stiffness tend to involve areas near the trunk and are not accompanied by muscle wasting or evidence of muscle damage on electromyography or

biopsy. This condition is associated with temporal arteritis (which can cause blindness).

Patients should be warned to inform their physician promptly if they develop severe headaches, visual changes, or significant jaw pain on repeated chewing.

(Choice 1) is associated with ankylosing spondylitis and a peripheral arthritis.

(Choice 2) is associated with polymyositis and polyarthralgias, sometimes with joint swelling and effusions.

(Choice 3) is occasionally accompanied by relatively mild arthralgias.

(Choice 4) may be accompanied by rheumatoid arthritis-like or lupus-like symptoms.

17. Question

1 points

A 71 year old man with a long history of poorly controlled hypertension presents to the emergency department with headache and visual changes. His blood pressure is 220/130 mm Hg. Current medications include atenolol, nifedipine, thiazide, and clonidine. An IV sodium nitroprusside drip is started. The patient is then transferred to the intensive care unit, where his blood pressure is 135/75mm Hg; however, he becomes hypoxemic with room air saturations falling to 80%. Which of the following is the most likely reason for this patient's hypoxemia?

1. Elevation of carboxyhemoglobin levels
2. Elevation of methemoglobin level
3. Hypoventilation
4. Loss of hypoxic pulmonary vasoconstriction ✓
5. Pulmonary embolism

INCORRECT ✗

The correct answer is 4.

Nitroprusside is a nonselective veno- and arterio dilator that works via release of nitric oxide. The intrinsic ability of the lungs to match ventilation with perfusion via vasoconstriction in relatively under ventilated lung areas is abolished with this therapy. Therefore, large areas of V/Q mismatch are created that result in often profound hypoxia.

(Choice 1) is incorrect. Carboxyhemoglobin is the result of binding of carbon monoxide to hemoglobin. This moiety cannot bind oxygen and results in a drastically reduced oxygen-carrying capacity. This patient has not been exposed to carbon monoxide. The byproduct of nitroprusside administration is cyanide.

(Choice 2) Methemoglobin is an oxidized form of hemoglobin in which the iron is in the Fe³⁺ configuration. This often results from blood being exposed to strong oxidizers such as nitrites. Methemoglobinemia is suspected in a cyanotic patient with normal oxygen tension. This form of hemoglobin cannot carry oxygen.

(Choice 3) Hypoventilation, which is one of the four mechanisms underlying hypoxemia, is usually quite apparent on clinical inspection.

(Choice 5) Pulmonary embolism would certainly produce hypoxia, but in the absence of any clinical or historical evidence for this diagnosis, it is very unlikely at this time.

18. Question

1 points

A 45 year old man with alcoholism is admitted with a diagnosis of acute pancreatitis. He requires large volumes of fluid to maintain blood pressure and urine output, but 24 hours after admission, he appears in stable condition. On the fourth hospital day, the patient develops rapidly progressive respiratory distress, with labored breathing and tachypnea. His temperature is 37.0 C (98.6 °F), pulse is 100/min, blood pressure is 128/75mm Hg, and respirations are 24/min. Intercostal retraction and crackles are appreciated on chest examination. Blood tests show:

Hematocrit: 42%

Leukocytes : 9800/mm³

Glucose: 110 mg/dL

BUN: 20 mg/dL

AST: 98 U/L

ALT: 60U/L

Amylase: 280 U/L

Arterial blood gas (room air)

pH: 7.32

PaO₂: 52mmHg

PaCO₂: 51 mm Hg

A chest x-ray film reveals diffuse bilateral infiltrates and air bronchograms, a normal cardiac silhouette, and minimal pleural effusions. Which of the following is the most likely diagnosis?

1. Acute bilateral bronchopneumonia
2. Adult respiratory distress syndrome (ARDS) ✓
3. Cardiogenic pulmonary edema
4. Exacerbation of acute pancreatitis
5. Pulmonary embolism

INCORRECT ✘

The correct answer is 2.

The clinical picture is consistent with ARDS, a disorder that may be triggered by a number of different conditions, among which is acute pancreatitis. Typically, ARDS develops 12 to 48

hours following the initiating event (3 to 4 days after acute pancreatitis) and is characterized by acute respiratory failure unresponsive to supplemental oxygen. Therapy includes treatment of the underlying condition and mechanical ventilation with positive end expiratory pressure (PEEP). The overall mortality rate is 50%.

(Choice 1) may result in shortness of breath; however, it usually does not cause such severe respiratory failure and is commonly accompanied by productive cough and fever. Furthermore, chest x-ray findings, especially diffuse infiltrates and air bronchograms, are consistent with ARDS and not with bronchopneumonia.

(Choice 3) must be ruled out because specific treatment is available. A normal cardiac silhouette and the pulmonary changes on chest x-ray do not support a diagnosis of cardiogenic pulmonary edema. In uncertain cases, it may be necessary to measure the pulmonary capillary wedge pressure by Swan-Ganz catheter.

(Choice 4), per se, is excluded by the clinical symptomatology and laboratory findings. There is no hyperglycemia, and leukocytes are only mildly elevated. However, the symptoms of acute pancreatitis can appear to improve while the extrapancreatic complications (i.e., ARDS) worsen.

(Choice 5) usually arises from venous thrombosis in the pelvis or in the legs in patients with prolonged immobility or hypercoagulable states. It manifests as acute breathlessness, pleuritic chest pain, tachypnea, and tachycardia. Chest x-ray is often normal or may show oligemia of the affected lung segment, and an arterial blood gas (ABG) study will show hypoxemia and hypocapnia. This patient developed progressive respiratory distress and signs and symptoms of diffuse alveolar lung damage, both of which are inconsistent with acute pulmonary embolism.

19. Question

1 points

A 47 year old woman comes to the physician because she has had several episodes of severe chest pain that awoke her in the early morning. She has no history of major physical illness or drug abuse, drinks alcohol only occasionally, and does not smoke. Her temperature is 37.0 C (98.6 °F), blood pressure is 126/78 mm Hg, pulse is 78/min and regular, and respirations are 12/min. An ECG reveals no abnormalities. No further studies are undertaken, and the physician tells the patient that her pain is probably of psychological origin. After a few days, the patient comes to the emergency department at 5 AM complaining of chest pain. An ECG reveals sinus rhythm with ST segment elevation. The patient is admitted, and coronary arteriography is performed, revealing no stenotic lesions. Intravenous administration of ergonovine during arteriography triggers chest pain accompanied by ST elevation on ECG. Which of the following is the most likely diagnosis?

1. Myocardial infarction
2. Prinzmetal angina ✓
3. Psychological chest pain
4. Stable angina

5. Unstable angina

INCORRECT ✗

The correct answer is 2.

The clinical presentation is characteristic of Prinzmetal angina, a form of recurrent myocardial ischemia due to transient coronary vasospasm. ST elevation on ECG during ischemic episodes is highly characteristic. This condition is most often seen in women younger than 50. Coronary angiography frequently fails to disclose any stenotic segments, but the ergonovine test (to be performed with great caution) triggers vasospasm and anginal pain.

(Choice 1) usually manifests with intense precordial pain that persists for more than 30 minutes associated with characteristic ECG changes.

(Choice 3) may manifest with variable clinical patterns and is usually associated with other symptoms, such as depression, anxiety, or panic attacks. ECG changes, such as ST elevation, are absent.

(Choice 4) Precordial pain due to stable angina, by definition, manifests with a predictable pattern, usually following constant amounts of physical exertion, emotional stress, or exposure to cold temperatures.

(Choice 5) usually follows a period of stable angina. The attacks of precordial pain become more frequent and less predictable, and tend to occur at rest. Increasing degrees of coronary artery stenosis and/or platelet thrombi are thought to be the underlying pathologic substrate.

20. Question

1 points

A 34 year old female flight attendant presents with a recurring, sharp pain radiating from her left ear to her mouth. She describes the pain as intense but intermittent, precipitated by cold, light touch, and chewing. Neurologic examination is normal. A tentative diagnosis of trigeminal neuralgia is made, and carbamazepine is prescribed. She returns 6 weeks later complaining of the same pain on both sides of her face and a new onset of urinary incontinence. Which of the following is the most likely diagnosis?

1. Acoustic neuroma
2. Amyotrophic lateral sclerosis
3. Bell palsy
4. Multiple sclerosis ✓
5. Myasthenia gravis

INCORRECT ✗

The correct answer is 4.

The most likely diagnosis in this young woman is multiple sclerosis. Trigeminal neuralgia typically occurs in patients older than 50; however, onset at a young age, bilaterality, and presence of objective signs of sensory loss on the affected side raises the suspicion of multiple sclerosis (MS). MS should be suspected in a patient with multiple neurologic findings that are “separated by time and location.”

(Choice 1) is a tumor at the cerebellopontine angle. It is associated with sensory hearing loss, facial nerve palsy, cerebellar dysfunction on the affected side, and headache. It is common in patients with neurofibromatosis.

(Choice 2) is a form of progressive motor neuron disease characterized by both upper and lower motor neuron involvement; fasciculations, muscle wasting, and weakness are observed. Even in the late stages of illness, sensory, bowel, bladder, and cognitive functions are preserved. Dementia is unusual. The illness is relentlessly progressive, leading ultimately to death.

(Choice 3) is characterized by loss of facial nerve function. Facial paralysis, loss of taste sensation, and hyperacusis may all be produced.

(Choice 5) is an autoimmune neuromuscular disorder involving skeletal muscles. The fundamental defect is a decrease in the number of available acetylcholine receptors at the postsynaptic muscle membrane. Sensory changes, bladder and bowel involvement, and loss of tendon reflexes are not usually seen.

21. Question

1 points

A 32 year old woman is brought to the emergency department following the rapid onset of profound malaise and fever. On arrival, the patient's temperature is 39.7 C (103.5 F), blood pressure is 110/75mm Hg, pulse is 110/min and regular, and respirations are 17/min. On examination, needle tracks and scars are noted on the forearms and thighs. Chest examination reveals a systolic murmur along the left lower sternal border. Blood tests show 16,000 leukocytes/mm³ and an erythrocyte sedimentation rate of 90/min. Which of the following is the most appropriate next step in management?

1. Broad spectrum antibiotic therapy
2. Echocardiographic studies
3. Three sets of blood cultures ✓
4. Toxicologic studies on blood and urine
5. Ventilation-perfusion lung scans

INCORRECT 

The correct answer is 3.

The rapid progression of a febrile illness, the systolic murmur, and the objective evidence indicating intravenous drug abuse point to infective endocarditis as the underlying etiology. The current recommendation is to obtain three different blood samples for culture over a 24-hour period before initiating antibiotic therapy, unless the patient's condition is critical. This allows identification of the infectious agent and aids in the choice of the most appropriate antibiotic regimen. Intravenous drug abusers are particularly prone to right sided infective endocarditis, especially *Staphylococcus aureus* infections on the tricuspid valve. Note that murmurs are infrequent in right-sided infections.

(Choice 1) should be started immediately after obtaining the necessary blood cultures. Until culture results are available, the combination of antibiotics should cover the three most frequent organisms responsible for infective endocarditis affecting native valves: viridans streptococci, *Staphylococcus aureus*, and *Enterococcus*.

(Choice 2) may document the presence of vegetations. Transthoracic echo-cardiography has a sensitivity of approximately 60%, whereas transesophageal is 90% sensitive in identifying vegetations.

(Choice 4) Although generally useful to document use of illicit drugs, would not be helpful as a diagnostic tool in this case.

(Choice 5) are used for the diagnosis of pulmonary infarction, which may occur as a result of embolism from right-sided vegetations.

22. Question

1 points

An 18 year old man comes to clinic for evaluation of weakness and fatigue lasting 6 weeks. Before these past 6 weeks, he reports being fairly healthy. He did, however, have a recent case of "the flu." On reviewing his medical records, it seems that approximately 2 months ago the patient had a mild hepatitis of unclear etiology (serologies for hepatitis A, B, and C were negative) that has since resolved. Before this illness, he has been healthy, takes no medications, and knows of no diseases that run in his family. He does not use illicit substances, does not smoke, rarely drinks alcohol, has never received a blood transfusion, has never had sex, and does not have any tattoos. Physical examination reveals marked pallor and a 2/6 non-radiating systolic murmur heard best at the right upper sternal border. Abdominal examination reveals a few scattered petechiae but no hepatosplenomegaly. Laboratory studies show:

Hematologic

Hematocrit: 15%

Hemoglobin: 5.0 g/dL

Leukocytes: 4,000/mm³ (normal differential)

Platelets: 15,500/mm³

Reticulocytes: 0.5%

The rest of the patient's laboratory studies, including a set of chemistries and liver function tests are unremarkable. The patient is admitted to the hospital and receives a transfusion with leukocyte-reduced blood products. A bone marrow biopsy is performed the next morning that shows cellularity of less than 5% with normal cellular morphology and no organisms on Gram stain. Which of the following is the most appropriate treatment?

1. Antithymocyte globulin
2. Bone marrow transplant ✓
3. Broad-spectrum antibiotics
4. Colony-stimulating factor
5. Intravenous corticosteroids

INCORRECT ✗

The correct answer is 2.

Patients with severe aplastic anemia need a bone marrow transplant. If the patient needs blood products, they should be leukocyte reduced to reduce allosensitization in likely transplant candidates (even in bone marrow transplant patients). The cause of this patient's aplastic anemia is not clear. Up to 50% of cases are idiopathic, though many of these may be from an undiagnosed viral infection that induces a host immune response or is directly marrow toxic. A small subset of cases follows an undiagnosed hepatitis, though there is no link with known viral hepatitis subtypes.

(Choices 1 & 5) Immune-modulating drugs, such as antithymocyte globulin, azathioprine, methotrexate, and corticosteroids are used in different bone marrow transplant protocols. In older patients or patients without good graft matches, they may be used as definitive therapy. The primary treatment of severe aplastic anemia, however, is bone marrow transplantation.

(Choice 3) are not indicated, as there is no evidence of a bacterial infection causing this patient's symptoms.

(Choice 4) do not treat aplastic anemia, which is primary marrow failure. Transplantation is necessary.

23. Question

1 points

A 70 year old woman has been in good health until 3 months ago, when she noted the appearance of plaques in her axillae and groin. She has also experienced anorexia and easy fatigability for the past few months. The patient has no history of major disease, and her family history is unremarkable. She is 165 cm tall (65 in) and weighs 53 kg (117 lb). Examination reveals several

slightly raised, brown plaques with a velvety surface in the flexural regions of neck, axilla, and groin. A biopsy is consistent with acanthosis nigricans. For the patient with recent onset of skin lesions, select the most appropriate initial diagnostic test.?

1. Allergen skin testing
2. Bacterial cultures of skin scrapings
3. Blood glucose measurement ✓
4. Gluten-free diet trial
5. HIV testing
6. Microscopic examination of KOH-treated skin scrapings

INCORRECT ✗

The correct answer is 3.

Acanthosis nigricans is a benign skin condition histologically characterized by papillomatous hypertrophy of the epidermis with hyperpigmentation. The lesions involve flexural regions of the body, particularly the axilla and groin. Although the lesions are benign, the sudden appearance of acanthosis nigricans in an elderly woman should raise the suspicion of an underlying malignancy, most commonly gastric cancer. Thus, extensive clinical and radiologic screening must be undertaken to rule out this possibility. Acanthosis nigricans is also associated with endocrinopathies, such as acromegaly, Cushing syndrome, hyperthyroidism, and glucose intolerance. Laboratory tests to screen for such diseases, including fasting glycemia, are thus appropriate. Glucose intolerance in elderly patients with acanthosis nigricans is due to insulin resistance resulting from autoantibodies to insulin-receptors.

24. Question

1 points

A 30-year-old, Caucasian male comes to the office for the evaluation of some pale patches in a mottled distribution over his trunk area. He just returned from a 2-week summer vacation in the Bahamas, where he first noticed these lesions. His skin is generally well-tanned. Located over his central upper trunk area are multiple, velvety pink, pale macules, measuring approximately 4-5 mm in diameter. These lesions scale on scraping. What is the most likely diagnosis?

1. Vitiligo
2. Seborrheic dermatitis

3. Tinea versicolor ✓
4. Pityriasis rosea
5. Tinea corporis

INCORRECT ✗

The correct answer is 3.

Tinea versicolor is a superficial fungal infection of the skin. It is characterized by pale, velvety pink or whitish, hypopigmented macules that do not tan and do not appear scaly, but scale on scraping. The causative agent is *Malassezia furfur*. Patients often present in the office once they notice that the involved areas never tan. Sometimes, the condition presents as hyper-pigmented macules that are velvety-tan or brownish. Microscopic examination of skin scrapings after KOH preparation reveals large, blunt hyphae and thick-walled budding spores (classic “spaghetti and meatballs” appearance). Topical treatment with selenium sulfide lotion and ketoconazole shampoo is recommended, and patients are informed that the change in pigmentation requires months to return to normal.

(Choice 1) The hypopigmentation in tinea versicolor can be mistaken for vitiligo; however, vitiligo usually presents with peri-orificial lesions or lesions on the tips of fingers. It is characterized by total depigmentation and not just lessened pigmentation, as in tinea versicolor.

(Choice 2) Seborrheic dermatitis is an acute or chronic papulosquamous dermatitis which is characterized by dry scales and an underlying erythema. The scalp, central face, presternal, interscapular area, umbilicus, and body folds are usually involved. Pigmentation changes are not seen.

(Choice 4) Pityriasis rosea lesions appear as oval, fawn-colored plaques that measure up to 2 cm in diameter and occur in a Christmas tree pattern. The initial lesion is called the herald patch, and is followed by a generalized eruption in 1-2 weeks.

(Choice 5) Tinea corporis or body ringworm presents as ring-shaped lesions with an advancing scaly border and central clearing, or as scaly patches over the trunk.

25. Question

1 points

A 48-year-old Caucasian female presents to your office due to a small swelling on her left lower eyelid. She has worked outdoors her whole life. This swelling has been present for the past 6 months. Recently, she noticed a loss of eyelashes on her lower eyelid. On examination, there is a small nodular lesion on the lower eyelid margin. It is firm, painless, pearly and indurated. Loss of lashes on the left lower eyelid is confirmed. Which of the following is the most likely diagnosis?

1. Squamous cell carcinoma

2. Keratoacanthoma
3. Basal cell carcinoma ✓
4. Squamous papilloma
5. Seborrheic keratosis

INCORRECT ❌

The correct answer is 3.

Basal cell carcinoma (BCC) is the most common malignant tumor of the eyelid and the most common malignancy in mankind. It usually occurs in fair-skinned individuals with a history of prolonged sun exposure. The lesions are most commonly slow-growing nodules with a pearly quality and a rolled border. There are often telangiectasias overlying and at the periphery of the lesion. Bleeding and ulceration are common features, and thinning or loss of eyelashes in the region of the tumor is typical. The most common location for eyelid BCCs is the lower eyelid margin. BCC rarely metastasizes, but spread from a periocular BCC into the orbit can occur, and enucleation of the eye may be required to treat such lesions. The most appropriate therapy is surgical excision using microscopically-controlled margins (Mohs technique).

(Choice 1) Squamous cell carcinoma is much less common and faster-growing. It often arises from a precursor lesion, such as an actinic keratosis, and typically has an overlying hyperkeratosis.

(Choice 2) Keratoacanthoma is a rapidly growing “volcano-like” nodule with a central keratotic plug. While these lesions are classically self-limited, many are treated as well-differentiated squamous cell carcinomas. Early treatment is indicated if the lesion is near an important structure, such as the eye.

(Choice 4) Squamous papilloma is the most common benign tumor of the eyelid. It presents as a frond-like or lobular projection.

(Choice 5) Seborrheic keratoses are most often greasy, brown, crust-like lesions with a stuck-on appearance.

26. Question

1 points

A 5-month-old infant is brought to the office by his mother because of a rash on his face, hands and chest. The baby is constantly scratching these areas, and his mother is having a hard time keeping his hands away from the rash. She has tried a variety of over-the-counter products and many home remedies, as advised by her mother, but has noted no improvement. On physical examination, there are erythematous lesions on his cheeks with erosion, scaling, excoriated papules and plaques. Similar lesions are also found on his trunk, scalp and forehead. The lesions are symmetrical, and the diaper area appears spared. What is the most likely diagnosis?

1. Contact dermatitis
2. Scabies
3. Exfoliative dermatitis
4. Atopic dermatitis ✓
5. Seborrheic dermatitis

INCORRECT ❌

The correct answer is 4.

Atopic dermatitis in infancy typically affects the face, scalp and extensor surfaces of the extremities – a distribution that differs significantly from that seen in adults. Lesions usually begin with pruritus alone and evolve to erythematous excoriated papules and plaques that may weep and become secondarily impetiginized. Atopic dermatitis is the result of decreased skin barrier function due to improper synthesis of components of the epidermal cornified cell envelope. This allows allergens ready access to the deeper levels of the epidermis where they may generate the immune response characteristic of atopic

dermatitis. Treatment is with improvement of skin barrier function through the use of mild cleansers and thick, bland emollients in addition to mild topical anti-inflammatory ointments.

(Choice 1) The history is not suggestive of contact dermatitis, which is more common in older children and adults after prior sensitization to an allergen such as poison ivy resin, nickel, neomycin or bacitracin among many other potential sensitizers.

(Choice 2) Scabies is caused by an infestation by Sarcoptes scabiei. Lesions favor the webspaces, the wrists and ankles, the genitals, nipples and waistline and typically appear as small pruritic papules in a small linear arrangement (burrows).

(Choice 3) Patients with exfoliative dermatitis (erythroderma) usually have a prior dermatological condition such as psoriasis, atopic dermatitis or mycosis fungoides (Sezary syndrome). The clinical case described is not consistent with erythroderma.

(Choice 5) Seborrheic dermatitis in infants most commonly manifests as “cradle cap”. Adherent, waxy scale on a base of mild erythema is typical.

27. Question

1 points

A 48-year-old white male comes to the emergency department with complaints of severe pain and swelling in his left leg. He sustained an injury to his left leg while playing tennis five days ago. The pain worsened over the past 2-3 days, and is now unbearable. He also complains of flu-like symptoms. His temperature is 39 °C(102 °F), pulse is 104/min, blood pressure is 110/80 mm Hg, and respirations are 18/min. Physical examination reveals an edematous limb with purplish

discoloration of the injured area, along with bullae and a serosanguineous discharge. The leg is extremely tender to touch. A scalpel incision of the skin reveals yellowish green necrotic tissues. What is the most likely diagnosis?

1. Thrombophlebitis
2. Cellulitis
3. Necrotizing fasciitis ✓
4. Erythema induratum
5. Toxic shock syndrome

INCORRECT ❌

The correct answer is 3.

Necrotizing fasciitis is a rapidly spreading infection involving the fascia of deep muscles. It usually occurs after trauma, although it may also occur around foreign bodies (in surgical wounds). Sometimes, it can be idiopathic (e.g., scrotal or penile necrotizing fasciitis). Group A hemolytic Streptococci and Staphylococcus aureus alone or in synergism are frequently the initiating infectious bacteria; however, other aerobic and anaerobic pathogens may be present. Typically, there is a sudden onset of pain and swelling at the site of trauma or recent surgery. As the condition progresses, there is purplish discoloration with gangrenous changes. A gloved finger can easily be passed between the 2 layers, revealing yellowish green necrotic

fascia, which helps in the diagnosis. Signs of systemic toxicity (e.g., fever, hypotension) may be present. CT scan is useful in identifying the involved site, which reveals necrosis, asymmetrical fascial thickening and gas in the tissues. Aggressive treatment is necessary to reduce morbidity and mortality. Thorough surgical debridement of all the necrotic tissues is the most important therapy. High-flow oxygen, fluid resuscitation, and broad-spectrum antibiotics should be included in the management. A history of diabetes mellitus should be suspected in patients with necrotizing fasciitis.

(Choice 1) Thrombophlebitis is characterized by palpable, indurated, cord-like, tender, subcutaneous venous segments. The accompanying fever is usually low-grade.

(Choice 2) Cellulitis is an acute spreading infection of the dermis and subcutaneous tissue. The hallmarks

of cellulitis are warmth, erythema, edema, and tenderness. Necrotic changes in deeper tissues are not seen.

(Choice 4) Erythema induratum appears as a nodular eruption in patients with tuberculosis. On examination, there are crops of small, tender, erythematous nodules involving the shins and calves.

(Choice 5) Toxic shock syndrome is characterized by invasion of the skin and soft tissues, acute respiratory distress, and renal failure. Infants, elderly patients, and those with underlying medical conditions are at risk for having a very invasive disease.

28. Question

1 points

A 50-year-old man comes to the emergency department due to acute onset respiratory difficulty. He also has periorbital, circumoral and facial edema. Two weeks ago, he experienced chest pain, profuse sweating and anxiety, and was subsequently admitted to the cardiac intensive care unit. At that time, his ECG showed ST segment elevation and Q waves in the inferior leads. He was taken to the catheterization lab and had an angioplasty with stent done for 100% occlusion of the right coronary artery. He was discharged with the following medications: aspirin, clopidogrel, metoprolol, enalapril, simvastatin and isosorbide mononitrate. In the ED, his pulse is 102/min, blood pressure is 110/70 mm Hg, respirations are 24/min and temperature is 36.8 °C(98.4 °F). Which of the following is most likely responsible for his present symptoms?

1. Metoprolol
2. Isosorbide
3. Clopidogrel
4. Aspirin
5. Enalapril ✓
6. Simvastatin

INCORRECT ❌

The correct answer is 5.

ACE inhibitors are the most common cause of acquired angioedema. Patients present with edema in the face, mouth, lips, tongue, glottis and larynx. Laryngeal edema can cause airway obstruction and be life threatening. Angioedema occurs due to the pro-inflammatory action of bradykinin, which promotes edema, inflammation and the sensation of pain. Angiotensin converting enzyme (ACE) is also known as kininase; it functions to degrade bradykinin. When ACE is inhibited, levels of bradykinin increase, thereby leading to angioedema. ACE inhibitors are usually started on the first post-infarction day in non-hypotensive patients, and patients typically present with angioedema within days to weeks after starting therapy (as in this patient). The first step in management of angioedema is to check for airway compromise and vasomotor instability, which require subcutaneous epinephrine administration if present. If airway obstruction fails to respond to epinephrine, an emergency tracheostomy is done. The ACE-inhibitor should be stopped immediately.

(Choice 1) The common adverse effects of β-blockers (metoprolol) are bradycardia, AV block, bronchoconstriction (clinically significant in patients with asthma and COPD), and male sexual dysfunction.

(Choice 2) Nitrates can cause headaches, hypotension and development of tolerance to the drug with continuous use.

(Choice 3) Clopidogrel uncommonly causes adverse reactions, the most significant of which is thrombotic thrombocytopenic purpura.

(Choice 4) Aspirin usually causes gastritis and promotion of gastric and duodenal ulcers. High doses may cause salicylism, which is characterized by vomiting, tinnitus, decreased hearing and vertigo.

(Choice 6) Stalins are associated with hepatotoxicity and myopathy.

29. Question

1 points

A 20-year-old woman presents with complaints of a rash for the past 2 days. She was in good health until 5-6 days ago, when she developed fever, malaise and headache. The rash first appeared on her face, and then rapidly spread to her trunk and extremities. Her pulse is 86/min, blood pressure is 110/70 mm Hg, respirations are 14/min, and temperature is 37.2 °C(99 °F). On examination, there is a pink maculopapular rash involving her face, trunk and extremities. Tender lymph nodes are palpable in the posterior auricular and posterior cervical areas. Her soft palate reveals patchy erythema. What is the most likely diagnosis?

1. Secondary syphilis.
2. Rubella.
3. Kawasaki disease.
4. Rocky mountain spotted fever.
5. Erythema multiforme.

INCORRECT

The correct answer is 2.

Rubella is caused by the RNA togavirus. The chronology of the disease is as follows:

1. Exposure to the virus (transmitted via respiratory droplets)
2. Development of fever, malaise, and tender suboccipital adenitis after 14-21 days
3. Characteristic rash appears 1-5 days later (maculopapular rash initially on the face, and then spreading to involve the trunk and extremities, lasting for less than 3 days)

Polyarthralgia is common in adults. Posterior cervical and posterior auricular lymphadenopathies are common. Few patients develop encephalopathy. Fetal I infection leads to congenital rubella syndrome. The risk to the fetus is highest if the mother contracts rubella in the first trimester. Patients can be treated with acetaminophen for symptomatic relief. Patients can be infectious from 1 week prior to the onset of the rash to 15 days after. Live attenuated rubella vaccine offers the best protection against infection.

(Choice 1) Secondary syphilis usually presents as localized or diffuse mucocutaneous rash and generalized tender lymphadenopathy. The rash may be macular, pustular or mixed. It characteristically presents over the palms and soles, which are not involved in rubella. The papules coalesce to form condylomata lata, which is highly suggestive of secondary syphilis.

(Choice 3) Kawasaki disease is a multisystem disease, and is also known as mucocutaneous lymph node syndrome. High fever, bilateral conjunctivitis, injected pharynx, cracked lips, strawberry tongue, edema, desquamation of extremities, polymorphic rash, and cervical lymphadenopathy are characteristic. A specific prodrome is not seen. It usually occurs in children under 10 years of age, and is very rarely seen in adults.

(Choice 4) Rocky Mountain spotted fever is characterized by a red macular rash, which starts over the wrists and ankles, and then spreads centrally. Influenza-like prodrome occurs.

(Choice 5) Erythema multiforme is characterized by the sudden onset of erythematous rash with target lesions. It usually follows infection with herpes simplex.

30. Question

1 points

A 4-year-old girl is brought to the office by her parents due to a red rash and blisters. Yesterday, she had a fever and was irritable. Today, she developed the rash with blisters. Her pulse is 90/min, blood pressure is 90/60 mm Hg, respirations are 14/min, and temperature is 39 °C (102 °F). On examination, there are superficial flaccid bullae and an erythematous rash diffusely distributed over her body. Nikolsky's sign is positive. Her face is edematous, and there is crusting around the mouth area. Her skin is warm and tender with exfoliation. What is the most likely diagnosis?

1. Toxic epidermal necrolysis
2. Staphylococcal scalded skin syndrome ✓
3. Scarlet fever
4. Erysipelas
5. Impetigo

INCORRECT ❌

The correct answer is 2.

Staphylococcal scalded skin syndrome is a disease of children, mostly those under 5-6 years old. It is a syndrome of acute exfoliation caused by toxins produced by phage group 2 *Staphylococcus aureus*. The prodromal infection is usually not apparent. The onset is sudden with diffuse erythema, skin tenderness and fever. Within a day, flaccid bullae appear.

Facial edema and perioral crusting are often seen. The treatment is focused on stabilizing the patient, and usually includes fluid replacement, topical wound care (treatment similar to burn wounds), and parenteral antibiotics that cover *Staphylococcus*.

(Choice 1) Toxic epidermal necrolysis is more benign than staphylococcal scalded skin syndrome. Hot, tender, erythematous morbilliform or discrete macules and loose patches of skin are characteristic. The oral mucosa is frequently involved, with blistering and erosions. Patients give a history of taking sulfonamides, phenytoin, barbiturates, or NSAIDs.

(Choice 3) Scarlet fever is a group A β -hemolytic streptococcal infection. Exudative tonsillitis precedes the condition. The rash typically appears as scarlet macules over generalized erythema.

(Choice 4) Erysipelas begins as a small erythematous patch that progresses to a red, indurated, tense, and shiny plaque. It usually occurs over the cheek, and there is often a history of trauma or pharyngitis. The presence of 'raised, sharply demarcated' advancing margins is a classic feature. Local signs of inflammation are universal. Overlying skin streaking and regional lymphadenopathy indicate lymphatic involvement. Over 80% of the cases are due to *Streptococci*, thus, penicillin is the drug of choice.

(Choice 5) Impetigo is a contagious infection of the skin that is caused by *Staphylococcus*, *Streptococcus* or both. The lesions appear as macules, vesicles, and bullae with honey colored crusts.

31. Question

1 points

A 23-year-old college student comes to the office due to itching all over her body for the past 10 days. She hardly gets to sleep at night because of it. Her roommate has similar complaints. Her vital signs are stable. Physical examination reveals vesicles and pustules arranged in short, gray wavy channels on the finger webs, heels of palms, and in wrist creases. There are papules over the nipples and areola of her breasts. What is the most likely diagnosis?

1. Insect bites
2. Urticaria
3. Scabies
4. Body lice
5. Bed bugs

INCORRECT 

The correct answer is 3.

Scabies is caused by an infestation of *Sarcoptes scabiei*. Patients present with generalized itching. The characteristic lesions are pruritic vesicles and pustules in "runs" over the finger

webs, heels of palms, and wrist creases. Pruritic papules may be seen over the nipples and areola in females, and over the scrotum and penis in males. The head and neck area are usually spared. Examination of scrapings from excoriated lesions under light microscopy reveals mites, ova, and feces. For adults, the treatment is 5 percent permethrin cream, which is applied from the neck down and left overnight. Low-potency topical steroids can be added to treat the dermatitis. Bedding and clothing should be cleaned or set aside for two weeks.

(Choice 1) Insect bites typically appear as pruritic papules that are grouped in the bite area. Vesicular and bullous bite reactions are common.

(Choice 2) Urticaria occurs as evanescent wheals or hives with intense itching. Most incidents are acute, self-limited and can result from immunologic or non-immunologic conditions.

(Choice 4) Body lice infect the seams of clothing. Nits are found in the seams, not on human hairs. Maculae caerulea (hemosiderin-stained purpuric spots where lice have fed) is diagnostic of body lice infestation.

(Choice 5) Bed bugs can be seen anywhere, but tend to occur in old furniture and hide in seams and folds of mattresses. The bites are painless, but pruritus and purpuric macules may appear. Bites are noted in groups of threes over exposed areas.

32. Question

1 points

A 32-year-old Asian female presents to the office with a mole on her foot that recently became darker. She has always had skin that is very sensitive to sunlight. She is unable to tan, and has had several sunburns when she did not use sunscreens. Her past medical history is insignificant. Her mother had 'a kind of skin cancer.' Physical examination reveals a dark mole with irregular borders on the left foot. Which of the following is the strongest risk factor for malignancy in this patient?

1. Asian race
2. Recently changed mole ✓
3. Family history
4. Sun sensitivity
5. Previous sunburns

INCORRECT ✗

The correct answer is 2.

Melanoma is the most dangerous form of skin cancer. It represents the most common cause of fatal malignancy in young adults. A recently changed mole is the strongest risk factor for

malignancy; it is associated with a relative risk (RR) of at least 10, but the RR can actually be as high as 200, according to several studies.

(Choices 3, 4 & 5) The other options are also risk factors for malignancy; however, these demonstrate a weaker association. Sun sensitivity increases the risk by 2- or 3-fold. A positive family history of melanoma increases the risk 8-fold. Previous sunburns are associated with an increased risk of melanoma, with an approximate RR of 2.

33. Question

1 points

A 7-year-old girl is brought to the office by her mother due to a rash all over her body. She was apparently in good health until 4 days ago, when she developed fever, cough and eye pain. This morning, she developed a rash on her face, which later spread all over her entire body. Her pulse is 86/min, respirations are 14/min, blood pressure is 110/70 mm Hg, and temperature is 37.2 °C(99 °F). On examination, there is an erythematous maculopapular rash covering her entire body. There are small red spots with bluish specks on her buccal mucosa. What is the most likely diagnosis?

1. Roseola infantum.
2. Rubella.
3. Varicella zoster infection.
4. Parvovirus infection.
5. Pararnyxovrus infection.

INCORRECT

The correct answer is 5.

Measles is a highly contagious disease that is caused by Paramyxovirus. The chronology of the disease is as follows:

- 1 . Exposure to the virus (transmitted via respiratory droplets)
2. Prodrome after 1 0 days (coryza, conjunctivitis, cough – remember the 3 ‘C’s!)
3. Koplik’s spots appear after 2-3 days (red spots with bluish specks over the buccal mucosa, opposite the premolar tooth)
4. Characteristic rash develops after 24 hours (erythematous maculopapular rash initially over the face, and then spreads to cover the entire trunk and extremities)

The complications are pneumonia, vitamin A deficiency, and bronchiectasis. Late complications are immunosuppression and subacute sclerosing panencephalitis.

(Choice 1) Roseola infantum is an infection caused by herpes virus 6. The illness starts with fever. After 4-5 days, a maculopapular rash appears over the trunk and spreads peripherally.

(Choice 2) Rubella is characterized by an erythematous, maculopapular rash with generalized lymphadenopathy. Slight fever, polyarthritis and polyarthralgia also occur.

(Choice 3) Varicella zoster causes chicken pox. After a prodrome of fever, malaise, and anorexia, a characteristic rash appears on the trunk and spreads peripherally. This rapidly develops into vesicles, which break to form scabs.

(Choice 4) Parvovirus causes erythema infectiosum. It begins as erythema of the cheeks, and then an erythematous rash appears on the arms and spreads to the trunk and legs.

34. Question

1 points

A 70-year-old patient presents to the ER with a 3-hour history of intensive retrosternal chest pain that radiates to the interscapular area. He states that he has never experienced this pain before. His past medical history is significant for a 20-year history of hypertension and a 10-year history of diabetes mellitus, type 2. His current medications include enalapril and hydrochlorothiazide. He does not smoke or consume alcohol. His vital signs are BP 180/110 mm Hg in the right arm and 178/110 mm Hg in the left arm, PR 85/min and RR 18/min. The physical examination revealed an early decrescendo-type diastolic murmur at the left sternal border. The EKG is normal. Which of the following is the best next step in the management of this patient?

1. Magnetic resonance imaging
2. Transesophageal echocardiography ✓
3. Aortography
4. CK MB and troponin T levels
5. Ventilation/perfusion scanning

INCORRECT ❌

The correct answer is 2.

The patient described in this scenario most probably has aortic dissection. Intensive retrosternal pain that radiates to the back of the chest, along with a normal EKG strongly suggests aortic dissection. Another important clue is the presence of the early diastolic murmur, characteristic of aortic regurgitation. Dissection of the ascending aorta may lead to acute aortic regurgitation. Hypertension is an important risk factor and blood pressure should be measured in both arms (there may be a difference in inter-arm blood pressure readings due to dissection). Although an aortogram was recommended as the most reliable diagnostic tool in diagnosing aortic dissection a decade ago (**Choice 3**), non-invasive methods have gained popularity more recently. The sensitivity and specificity of the MRI, CT and transesophageal echocardiography in diagnosing aortic dissection exceeds 90%. Transesophageal echocardiography is usually preferred to an MRI (**Choice 1**) because the latter is time-consuming.

(Choice 4) Cardiac troponins are the markers of myocardial injury. They are used in patients with acute coronary syndromes. This patient has no EKG changes, and the pain is not typical of acute coronary syndrome.

(Choice 5) Ventilation/perfusion scanning is used in patients with suspected thromboembolism of the pulmonary artery. In that case, the patient would also be tachypneic, tachycardic and hypotensive.

35. Question

1 points

A 46-year-old man complains of exertional dyspnea and dry cough. He also describes occasional episodes of a suffocating nighttime cough that is relieved only when he stands up. His medical history is significant for a myocardial infarction six months ago. His current medications are metoprolol, aspirin and simvastatin. He does not use tobacco but drinks alcohol on social occasions. His father died of a stroke and his mother suffers from diabetes mellitus. His blood pressure is 150/100 mmHg and his heart rate is 60/min. Chest examination reveals bibasilar rales. His cardiac apex is palpated in the sixth intercostal space. The liver span is 12 cm. Bilateral pitting leg edema is also present. Which of the following most likely contributes to his edema?

1. Constriction of the renal arterioles ✓
2. High sodium delivery to the distal tubule
3. Increased renal blood flow
4. Increased renal potassium loss
5. High portal venous resistance

INCORRECT ❌

The correct answer is 1.

This patient has ischemic heart disease, cardiomegaly, pulmonary edema, paroxysmal nocturnal dyspnea, elevated venous pressure, and peripheral edema, all findings consistent with a diagnosis of congestive heart failure (CHF). In heart failure, there is a decrease in the effective circulating blood volume, leading to renal hypoperfusion. Due to activation of the renin-angiotensin-aldosterone system, the kidney's arterioles constrict (both afferent and efferent) and sodium reabsorption is enhanced. These changes increase water retention and elevate the total body volume, further exacerbating the CHF.

(Choice 2) In CHF, there is a decrease in sodium delivery to the distal tubule due to both decreased renal perfusion and increased sodium retention more proximally in the kidney.

(Choice 3) In CHF, renal perfusion is decreased, not increased.

(Choice 4) Sodium is the principle electrolyte responsible for edema. Potassium does not play a significant role in the development of edema.

(Choice 5) Portal hypertension is the hallmark of cirrhosis. This patient does not have significant risk factors for cirrhosis (e.g. alcoholism, hepatitis C) and does not have other stigmata of chronic liver disease like spider angiomata, palmar erythema, or ca put medusa.

36. Question

1 points

A 22-year-old white female is brought to your office by her mother because of the recurrent syncopal episodes. The first episode occurred about one year ago when her roommate committed suicide and then several similar episodes occurred usually provoked by a strong emotion. The episodes are preceded by lightheadedness, weakness, and blurred vision and last about three minutes with rapid recovery of consciousness. Past medical history is insignificant. She is not taking any medications and denies drug abuse. Her blood pressure is 110/70 mm/Hg while supine and 108/170 mm/Hg while standing. Physical findings are within normal limits. EKG performed one month ago was normal. Which of the following is the next best step in the management of this patient?

1. Echocardiography
2. 24-hour (Holter) monitoring
3. Electroencephalogram
4. Invasive electrophysiologic testing
5. Upright tilt table testing ✓

INCORRECT ✗

The correct answer is 5.

The most probable cause of this patient's episodes is vasovagal syncope (common faint). This is also known as neurally mediated or neuro cardiogenic syncope. The clinical scenario described is very typical for this condition including prodrome (lightheadedness, weakness, and blurred vision), provocation by an emotional situation, and rapid recovery of consciousness. Vasovagal syncope is frequently recurrent. In this case, upright tilt table testing with or without pharmacologic provocation (isoproterenol) may be indicated to confirm the diagnosis.

(Choice 2) 24-hour monitoring or invasive electrophysiologic testing **(Choice 4)** are indicated when arrhythmia is suspected as a cause of syncope. This is usually the case in patients with coronary artery disease and underlying cardiac disease.

(Choice 1) Echocardiography can confirm the diagnosis of hypertrophic cardiomyopathy or acquired valvular defects. Generally, if history and physical examination are not indicative of a cardiac disease, the probability of cardiogenic syncope is low.

(Choice 3) EEG is used when seizure is suspected as a cause of syncope. The scenario described is not characteristic for seizure, e.g., presyncopal prodrome and rapid recovery of consciousness.

37. Question

1 points

A 32-year-old man presents to the emergency department with a three day history of fever, cough and weakness. His blood pressure is 120/80 mmHg and his heart rate is 110/min. Physical examination reveals multiple needle tracks on his arms. ECG shows sinus tachycardia but is otherwise normal. Chest X-ray shows scattered round lesions in the peripheral lung fields bilaterally. Urinalysis is positive for 2+ protein. Which of the following accompanying findings is most likely in this patient?

1. S4 when patient is in the left lateral decubitus position
2. Systolic murmur that increases on inspiration ✓
3. Diastolic murmur heard best with the patient sitting up
4. Systolic murmur that increases when the patient stands up
5. Paradoxical splitting of S2

INCORRECT ❌

The correct answer is 2.

This patient has bacterial endocarditis affecting the tricuspid valve based on the following evidence: He has fever, weakness, and cough; there is physical exam evidence of intravenous drug abuse; and his chest X-ray is concerning for septic emboli from the tricuspid valve. Septic pulmonary emboli typically cause cough, chest pain, and hemoptysis and produce numerous round alveolar infiltrates on chest X-ray. This patient's proteinuria is likely the result of septic emboli to the kidneys or immune-complex deposition. IV drug users are at increased risk for bacterial endocarditis involving the right-sided heart valves.

Tricuspid regurgitation is common in individuals with endocarditis of the tricuspid valve, and causes a systolic murmur that increases on inspiration.

(Choice 1) A fourth heart sound (S4) audible with the patient in the left lateral decubitus position is suggestive of hypertensive cardiomyopathy. An audible S4 can be a normal finding in children and young adults.

(Choice 3) Aortic regurgitation produces a diastolic murmur that is best heard when the patient sits up. While the aortic valve is a common site of infective endocarditis in both IV drug users and non-drug users, it would not explain the septic pulmonary emboli seen here on chest X-ray.

(Choice 4) Hypertrophic obstructive cardiomyopathy (HOCM) produces a systolic murmur that increases on standing. HOCM is not associated with endocarditis.

(Choice 5) Paradoxical splitting of the second heart sound (S2) occurs in patients with left bundle branch block (LSSS) due to delayed closure of the aortic valve. LSSS is not strongly associated with endocarditis.

38. Question

1 points

A 34-year-old woman presents to your office complaining of several months of chest pain. She says that the pain is left-sided, does not change with deep inspiration, and typically lasts several hours. The pain has no relation to physical activity, but worsens with emotional stress. The patient has no significant family history, and does not use tobacco, alcohol or drugs. She takes no medications and has no drug allergies. On exam, her blood pressure is 110/70 mm Hg and her heart rate is 78/min. ECG is normal. Which of the following is the best next step in her management?

1. Stress thallium myocardial perfusion testing
2. Stress ECG testing
3. Transthoracic echocardiography
4. Lower extremity venous ultrasonography
5. Chest X-ray
6. Reassurance ✓

INCORRECT ✗

The correct answer is 6.

There are several methods for determining a patient's risk of coronary artery disease, ranging from epidemiological models like the Framingham 10-year risk score to stress testing. These methods are most helpful for individuals at intermediate risk for coronary artery disease. This is because a negative noninvasive evaluation for coronary artery disease in a high risk patient is likely to be a false negative, whereas a positive test in a low risk patient is likely to be a false positive. Test results are most likely to change the management of intermediate risk patients. The patient described is at low risk for coronary artery disease. She does not have risk factors like male gender, family history, or smoking. Moreover, her chest pain would be unusual for angina, especially given that it is unrelated to activity and lasts for hours. The etiology of her chest pain most likely has a psychosocial cause, and she should be reassured with regards to her cardiac health.

(Choices 1 & 2) This patient is at low risk for coronary disease and does not need a stress test

(Choice 3) A transthoracic echocardiogram can assess cardiac ischemia by detecting wall motion abnormalities during stress. As described above, this patient is at low risk for cardiac disease.

(Choice 4) Given her normal heart rate, non-pleuritic pain, and lack of dyspnea, this patient is unlikely to have a pulmonary embolism. Moreover, a helical chest CT would be a better study to detect a PE than ultrasonography.

(Choice 5) A chest X-ray is indicated if the patient's story raises concerns for infection, a primary lung process, broken ribs, or pneumoperitoneum. As described above, this patient's chest pain is most likely psychosocial in origin.

39. Question

1 points

A new test is devised to detect HIV. It has a sensitivity of 90% and specificity of 80% compared to the gold standard. Consider that the test is used in two populations: a population in Africa having an HIV prevalence of 0.20 (20%), and a population in Asia having an HIV prevalence of 0.01 (1 %). Which is the most accurate statement concerning the new test?

1. Sensitivity of the test is higher in the African population
2. Specificity of the test is higher in the Asian population
3. Positive predictive value of the test is higher in the African population ✓
4. Negative predictive value of the test is lower in the Asian population
5. The test is not reliable in the African population

INCORRECT ❌

The correct answer is 3.

The traditional interpretation of positive predictive value (PPV) is the proportion of people with positive test results that actually have the disease. It is easier to understand the concept in terms of probability: if a patient has a positive test result, what is the probability that he/she has the disease? PPV depends on the prevalence of the disease (very important concept to remember). The more common the disease (e.g., 20% prevalence of HIV in the African population), the greater the probability that a patient from that population and with a positive test actually has the disease (i.e., has a true positive result). In the Asian population, the probability of a false-positive result for a patient with a positive test result is higher, because of the low prevalence of HIV.

(Choices 1 & 2) The sensitivity and specificity of a test do not depend on the prevalence of the disease in the population.

(Choice 4) Like positive predictive value, negative predictive value depends on the prevalence of the disease in the population, but has an inverse association with the prevalence. As the prevalence of the disease increases, the negative predictive value decreases because the probability of a true negative result for a patient who tested positive is high in a population with a low prevalence of the disease (i.e., the Asian population example).

(Choice 5) The statement that the test is not reliable in the African population is not correct, because the test has high sensitivity and specificity.

40. Question

1 points

A study was conducted to assess the association between L-tryptophan use and the development of Eosinophilia-Myalgia Syndrome (EMS). Patients with EMS were asked about the use of products containing L-tryptophan during the last 6 months. At the same time, people without EMS were randomly selected from the same population where the patients came from, and asked about their experience with L-tryptophan containing products within the last 6 months. The study showed that the use of L-tryptophan is significantly associated with EMS. Which of the following measures of association are the investigators most likely to report?

1. Relative risk
2. Median survival
3. Exposure odds ratio ✓
4. Relative rate
5. Prevalence odds ratio

INCORRECT ✗

The correct answer is 3.

The above case describes a typical case-control study design. Patients with the disease of interest (cases) and people without the disease (controls) are asked about previous exposure to the variable being studied (L-tryptophan use). The main measure of association is the exposure odds ratio, in which the exposure of people with the disease (cases) is compared to the exposure of those without the disease (controls).

(Choices 1 & 4) Incidence measures (e.g., relative risk or relative rate) cannot be directly measured in case-control studies because the people being studied are those who have already developed the disease. Relative risk and relative rate are calculated in cohort studies, where people are followed over time for the occurrence of the disease.

(Choice 2) Median survival is calculated in cohort studies or clinical trials, and is usually used to compare the median survival times in two or more groups of patients (e.g., receiving a new treatment or placebo).

(Choice 5) Prevalence odds ratio is calculated in cross-sectional studies to compare the prevalence of a disease between different populations.

41. Question

1 points

A cohort study was conducted to assess the relationship between high saturated fat consumption and the occurrence of colorectal carcinoma among women. A group of women aged 40-65 was selected. The baseline saturated fat consumption was calculated using a food questionnaire, and the cohort was followed for seven years for the development of colon cancer. The study showed that women with high baseline saturated fat consumption have four times the risk of colorectal cancer in a 7-year period, compared to women with low fat consumption ($RR = 4.0$, 95% CI= 1.5-6.5). According to the study results, what percent of colorectal carcinoma in women with high fat consumption could be attributed to their diet?

1. 25%
2. 50%
3. 75%
4. 90%
5. 100%

INCORRECT ❌

The correct answer is 3.

Attributable risk percent (ARP) or etiologic fraction is an important measure of the impact of a risk factor being studied. ARP represents the excess risk in a population that can be explained by exposure to a particular risk factor. It is calculated by subtracting the risk in the unexposed population (baseline risk) from the risk in the exposed population, and dividing the result by the risk in the exposed population:

$ARP = (\text{risk in exposed} - \text{risk in unexposed}) / \text{risk in exposed}$.

An easier way to calculate the ARP is to derive it from the relative risk (RR): $ARP = (RR - 1) / RR$.

In this case, $ARP = (4.0 - 1) / 4.0 = 0.75$ (75%). According to the study results, 75% of colorectal carcinoma in the high consumption group was attributable to high saturated fat intake.

42. Question

1 points

An investigator is studying the relationship between the selected variables and tuberculosis in the city. Two groups of people are selected (i.e., those with and without tuberculosis), and their clinical records for the last 15 years are obtained. Which of the following is the study design being used?

1. Prospective cohort study
2. Case control study ✓
3. Retrospective cohort study
4. Randomized control trial
5. Cross sectional study

INCORRECT ✗

The correct answer is 2.

The two main objectives of epidemiological studies are descriptive and analytical.

Descriptive epidemiology deals with rates, ratios and distribution; it explains the determinants of disease in the form of time, place and person. Analytical epidemiology tests the hypothesis created by descriptive epidemiology; it consists of observational studies and experimental studies. Observational studies include case control, cohort and cross-sectional studies.

Case control study is also known as retrospective study. The movement is from the effect to the cause. The researcher begins with a population with a certain outcome, and subjects are classified as either “cases” or “controls” based on the outcome status. The cases and controls are assessed retrospectively to look for the presence of risk factors. Exposure status is determined by personal interviews, health records, laboratory reports, etc.

(Choice 1) A prospective or longitudinal cohort study divides the study group into “exposed” and “not exposed.” Each subject is then followed prospectively until the onset of disease.

This study is considered stronger than a case control and cross sectional study.

(Choice 3) A retrospective cohort study starts at some point between the exposure and outcome. The researcher reviews past records, classifies subjects as “exposed” and “not exposed”, and then follows them until the outcome. In a cohort study, the study subjects are free of the outcome at the time a study begins.

(Choice 5) In a cross-sectional study, both the exposure and outcome are studied at one point of time (at one cross section of time). Since both exposure and outcome are present for some time before the study, it is not possible to determine the temporal association between the exposure and outcome from a cross sectional study.

(Choice 4) Randomized control trial is a type of experimental study, and is considered as the gold standard for studying the efficacy of a treatment or procedure. Subjects are randomly assigned to an experimental or control group. This type of study has the least bias and helps to show a strong causal relationship.

43. Question

1 points

Two cross-sectional studies were conducted using different questionnaires to determine the prevalence of over-the-counter analgesics use in a population. The first study showed a prevalence of 7.5% (95% confidence interval 6.0- 9.0), and the second study demonstrated a prevalence of 7.3% (95% confidence interval 6.9- 7.6). If the true prevalence of over-the-counter analgesics use in the population is 7.4%, which of the following statements about the results of the study is the most accurate?

1. The first study results are more specific
2. The second study results are more sensitive
3. The first study results are more valid
4. The first study results are more accurate
5. The second study results are more precise ✓

INCORRECT ✗

The correct answer is 5.

Precision is the measure of random error in the study. The study is precise if the results are not scattered widely; this is reflected by a tight confidence interval. The first study has a wider confidence interval compared to the second study; therefore, the second study is more precise.

(Choices 1 & 2) Specificity and sensitivity are measures of validity. The sensitivity and specificity of the questionnaires used in these studies cannot be determined from the given information.

(Choices 3 & 4) Validity and accuracy are measures of systematic error (bias). Accuracy is reduced if the result does not reflect the true value of the parameter measured. Increasing the sample size increases the precision of the study, but does not affect accuracy. In our case, the results of both studies are pretty close to the true value, and are thus seemingly accurate.

44. Question

1 points

A 53-year-old man comes to the office because of difficulty reading fine print over the last year. He now has to hold books, menus, and magazines at an arm's length in order to read them. He has never had visual problems before. Which of the following is most likely abnormal in this patient?

1. Corneal shape
2. Lens elasticity ✓
3. Lens opacity
4. Macula
5. Peripheral retina

INCORRECT ✗

The correct answer is 2.

This patient is most likely suffering from presbyopia, which is a common age-related disorder that results from the loss of elasticity in the lens. This decrease in elasticity prohibits accommodation of the lens, which is required in order to focus on near objects. The tendency of patients to hold reading material at a further distance is classic for presbyopia. Patients often have no history of eye problems. Most patients will report the onset of presbyopia while they are in their forties, and symptoms typically peak at some point in their sixties. The poor near vision associated with presbyopia can easily be improved with reading glasses.

(Choice 1) A non-spherical cornea can lead to astigmatism, which typically presents with blurry vision both at a distance and up close.

(Choice 3) Increased lens opacity is the etiology of cataracts. Patients may have difficulty reading, but a history of difficulty with night vision or driving at night is more characteristic.

(Choice 4) Age-related macular degeneration is a common cause of visual loss in patients over the age of

50, but it is typically associated with central visual field loss.

(Choice 5) Disease located in the peripheral retina is usually secondary to diabetes, which can lead to either proliferative or non-proliferative retinopathy. This patient, however, has no known history of diabetes.

45. Question

1 points

A 65-year-old white man is complaining of a sudden loss of vision in his left eye which resolved after 15 minutes. "It seemed like a curtain was falling down in my eye!" said the patient. He recalls having a similar episode 3 months ago. His past medical history is significant for hypertension, for which he takes lisinopril (20mg) and hydrochlorothiazide (25mg) daily. His pulse is 82/min, blood pressure is 140/90 mm Hg, respirations are 14/min, and temperature is normal. Fundoscopy reveals zones of whitened, edematous retina following the distribution of the retinal arterioles. What is the most likely diagnosis?

1. Central retinal artery occlusion
2. Amaurosis fugax ✓
3. Central retinal vein occlusion
4. Vitreous hemorrhage
5. Hypertensive retinopathy

INCORRECT ✗

The correct answer is 2.

Amaurosis fugax is characterized by visual loss that is usually monocular, transient, and described as 'like a curtain falling down.' Ophthalmoscopy reveals zones of whitened, edematous retina following the distribution of the retinal arterioles. The condition is usually seen in patients with atherosclerosis, cardiovascular disease, or hypertension. It is caused by retinal emboli from the ipsilateral carotid artery. Rarely, cholesterol emboli or plaques can be visualized. Non-invasive evaluation of the carotids is useful in providing information regarding the degree of stenosis. Treatment of the atherosclerosis is important to reduce the risk of stroke.

(Choice 1) Central retinal artery occlusion (CRAO) is also characterized by the sudden painless loss of vision in one eye; however, the fundoscopic findings differ. Ophthalmoscopy in patients with CRAO reveals pallor of the optic disc, cherry red fovea, and boxcar segmentation of blood in both the retinal arteries and veins.

(Choice 3) Central retinal vein occlusion presents with sudden, painless, unilateral loss of vision. It is also noted in patients with a history of hypertension. Ophthalmoscopic signs are disk swelling, venous dilation, tortuosity, retinal hemorrhages and cotton wool spots.

(Choice 4) Vitreous hemorrhage presents with a sudden loss of vision and floaters in the visual field. Diabetic retinopathy is the most common cause. An important clue to the diagnosis is a fundus that is hard to visualize with obscure details.

(Choice 5) Patients with hypertensive retinopathy usually do not show any symptoms associated with visual impairment. There is initially focal spasm of arterioles, followed by progressive sclerosis and narrowing. Fundoscopy findings may reveal AV nicking, copper wiring or silver wiring, exudates and hemorrhages (specific finding depends on the grade of retinopathy).

46. Question

1 points

A 3-day-old female infant is noticed to have copious, purulent discharge from both eyes. Lid edema and chemosis are also noted. She was born by normal vaginal delivery. Her mother is a 20-year-old primigravida who had no prenatal care. Which of the following is the most likely diagnosis?

1. Chlamydia trachomatis
2. Staphylococcus aureus conjunctivitis
3. Chemical conjunctivitis
4. Nasolacrimal duct obstruction
5. Gonococcal conjunctivitis ✓

INCORRECT ✗

The correct answer is 5.

This patient's presentation is most consistent with gonococcal conjunctivitis, which should be suspected in neonates who present two to five days after delivery with purulent conjunctivitis. This infection is acquired through contact with infected genital secretions, and can be quite severe, possibly leading to corneal ulceration and blindness without treatment. In neonates with suspected gonococcal conjunctivitis, a gram stain of the conjunctival exudate should be done to look for intracellular gram-negative diplococci, and culture should be performed on Thayer-Martin media.

(Choice 1) Chlamydia trachomatis is also a common cause of neonatal conjunctivitis. However, it normally presents five to fifteen days after birth and is usually less purulent than that seen with gonococcal conjunctivitis.

(Choice 2) Staphylococcus aureus conjunctivitis is uncommon in neonates.

(Choice 3) Chemical conjunctivitis is occasionally seen in neonates who are given prophylactic silver nitrate eye drops, but it would not be expected to produce purulent discharge. In addition, it usually occurs within the first 24 hours after birth.

(Choice 4) Dacryocystitis (nasolacrimal duct obstruction) occurs days to weeks after birth. It presents as chronic tearing and mattering on the eyelids that often resolves with gentle massaging of the lacrimal sac. It is usually unilateral.

47. Question

1 points

A 22-year-old Caucasian female presents to the office with several months history of decreased visual acuity and decreased brightness sensation in the right eye. Slight exophthalmos of the right eye is present on physical examination, and ophthalmoscopy shows pallor of the right optic disk. Several cate-au-lait spots and intensive axillary freckling are present. Which of the following is the most likely cause of this patient's visual problems?

1. Pigment retinitis
2. Pigment retinitis

- 3. Optic glioma ✓
- 4. Pituitary adenoma
- 5. Optic neuritis

INCORRECT ✗

The correct answer is 3.

Intensive axillary freckling and cate-au-lait spots are suggestive of neurofibromatosis, type 1 . Optic glioma is a well-known complication of neurofibromatosis, type 1 . It occurs in 15% of patients with this disease. A history of slowly progressive unilateral visual loss and dyschromatopsia are characteristic. Exophthalmos is usually present on physical examination. The optic disk may be normal, swollen, or atrophic.

The other conditions listed are less likely to occur in patients with neurofibromatosis, type 1 .

(Choice 1) Pigment retinitis leads to bilateral vision loss. It is not characteristic for neurofibromatosis.

(Choice 2) Retinal hamartoma is typical for tuberous sclerosis.

(Choice 4) Pituitary adenoma results in bitemporal hemianopsia.

(Choice 5) Optic neuritis is frequently the early manifestation of multiple sclerosis. Visual loss develops typically faster, and no exophthalmos is present.

48. Question

1 points

A 65-year-old African American man comes to the emergency department due to a sudden loss of vision in his right eye. He has had diabetes, and has been treated with metformin and glyburide for the past 10 years. Visual acuity is reduced to light perception in his right eye, and normal in his left. His vital signs are normal. Ophthalmoscopy reveals loss of fundus details, floating debris and a dark red glow. What is the most likely diagnosis?

- 1. Retinal detachment
- 2. Diabetic retinopathy
- 3. Vitreous hemorrhage ✓
- 4. Central retinal vein occlusion
- 5. Age related macular degeneration

INCORRECT ✗

The correct answer is 3.

Vitreous hemorrhage typically presents as a sudden loss of vision and onset of floaters (as in this patient). The most common cause is diabetic retinopathy. An important diagnostic clue is that the fundus is hard to visualize, and even if it is visualized, details may be obscured.

Immediate ophthalmoscopic consultation is required. For patients with underlying medical conditions, conservative treatment (i.e., upright position during sleep, which enhances settling of the hemorrhage) is recommended.

(Choice 1) Retinal detachment refers to the separation of the inner layers of the retina. It may be associated with metabolic disorders (e.g., diabetes mellitus), trauma (including ocular surgery), vascular disease, myopia, or degeneration. Patients typically complain of photopsia with showers of floaters.

(Choice 2) Diabetic retinopathy patients are usually asymptomatic, even though changes in fundoscopy are seen. Vitreous hemorrhage frequently occurs in patients with proliferative diabetic retinopathy. Once a diabetic patient presents with a sudden onset of visual loss with numerous floaters, a vitreous hemorrhage is most likely to have occurred.

(Choice 4) Central retinal vein occlusion presents as a sudden, painless, unilateral loss of vision. It is also noted in patients with a history of hypertension. Ophthalmoscopic signs are disk swelling, venous dilation and tortuosity, retinal hemorrhages, and cotton wool spots.

(Choice 5) Patients with macular degeneration typically present with painless progressive blurring of central vision, which can be acute or insidious. It occurs bilaterally.

49. Question

1 points

A 62-year-old female is brought in by EMS due to a severe right-sided headache, nausea and eye pain. She was fixing a light bulb, when she suddenly felt pain in her right eye. She decided to rest, but the eye pain only got worse. In the next few minutes, she developed loss of vision, photophobia and redness in the same eye. She took medications to relieve the accompanying headache, but the eye pain persisted. She denies any trauma. Her past medical history is significant for diabetes and hypertension. She appears to be in intense pain with bouts of nausea. Her right eye is red, with conjunctival flushing and visual acuity of 20/200. Her right pupil is mid-dilated and non-reactive to light. The same eye feels hard on palpation. The one treatment that should be avoided in this patient is:

1. Mannitol
2. Acetazolamide
3. Pilocarpine
4. Timolol
5. Atropine ✓

INCORRECT ❌

The correct answer is 5.

Acute glaucoma is a medical emergency. Narcotics are used to control the pain. The increased intraocular pressure is reduced with mannitol, acetazolamide, timolol or pilocarpine. Atropine should be avoided since it can dilate the pupil and worsen the glaucoma. Sometimes, mydriatic agents such as atropine can precipitate glaucoma.

(Choice 1) The first line of treatment for an acute episode of glaucoma is to administer mannitol intravenously. It is an osmotic diuretic and works immediately.

(Choice 2) Acetazolamide is a carbonic anhydrase inhibitor that rapidly reduces further production of aqueous humor, thus decreasing intraocular pressure.

(Choice 3) Pilocarpine rapidly reduces intraocular pressure by opening the canals of Schlemm and allowing for drainage of the aqueous humor. It is applied topically.

(Choice 4) Timolol is a β -blocker that decreases the intraocular pressure by increasing drainage of the aqueous humor. It is administered topically.

50. Question

1 points

A 60-year-old woman complains of decreasing vision and a dull ache over her left eye for the past 12 hours. She had a successful surgical cataract extraction in her left eye five days ago. Her blood pressure is 140/90 mm Hg, pulse is 92/min, respirations are 14/min, and is 38.1 °C (101.7 °F). Examination of the left eye reveals a swollen eyelid, edematous conjunctiva, and exudates in the anterior chamber. Testing with Snellen's chart demonstrates decreased visual acuity in her left eye. What is the most likely diagnosis?

1. Conjunctivitis
2. Corneal ulceration
3. Uveitis
4. Postoperative endophthalmitis ✓
5. Cavernous sinus thrombosis

INCORRECT ❌

The correct answer is 4.

Postoperative endophthalmitis is the most common form of endophthalmitis. It usually occurs within six weeks of surgery. It is an infection within the eye, particularly the vitreous. Patients usually present with pain and decreased visual acuity. Examination reveals swollen eyelids and conjunctiva, hypopyon, corneal edema and infection. The vitreous can be sent for Gram stain and culture. Based on the severity, intravitreal antibiotic injection or vitrectomy is done.

(Choice 1) Conjunctivitis presents with excessive tearing, burning sensation, mild pain, conjunctival, and eyelid edema. Vision is not affected.

(Choice 2) Corneal ulceration presents as a foreign body sensation, blurred vision, photophobia, and pain. A history of contact lens use, recent trauma, or ocular disease may be present. The eye is erythematous, and ciliary injection is present. Purulent exudates are seen in the conjunctival sac and on the ulcer surface.

(Choice 3) Uveitis presents as blurred vision with moderate pain, conjunctival injection, and constricted pupils. Hypopyon is seen in severe anterior uveitis. Keratic precipitates ("mutton fat") and iris nodules may be seen. It is associated with HLA 827-related conditions

(Choice 5) Cavernous sinus thrombosis is characterized by proptosis, ophthalmoplegia, chemosis, and visual loss. It occurs due to hematogenous spread from an infected, inflamed sinus.



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